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3 a summer for generating a difference signal representative of a difference between the first voltage value and the second voltage value, if an absolute value of the difference between the first voltage value and the second voltage value exceeds a freeze threshold, then said long term filter maintains said second voltage value constant, and if the absolute value of the difference between the first voltage value and the second voltage value exceeds a fault threshold, then said apparatus generates a fault indicator signal.

REMARKS

The Office Action mailed October 25, 2001 has been carefully reviewed and the foregoing amendment has been made in consequence thereof. Submitted herewith is a Submission of Marked Up Claims

Claims 1-18 are pending in this application. Claims 1-18 stand rejected.

The objection to the drawings under 37 C.F.R. 1.81 is respectfully traversed. With respect to illustrating a memory, to expedite the prosecution, Applicants submit herewith a Request for Approval of Drawing Change. Specifically, Figure 2 has been amended to include a memory. Applicants respectfully request approval of the drawing changes. Upon approval of the drawing changes, Applicants will submit substitute drawings incorporating the above-noted change.

With respect to the comparator, Claims 6 and 15 have been amended to remove references to a comparator. Furthermore, the specification was previously amended to indicate that the comparator is not shown. Applicants respectfully submit that the specification, in light of the Figures, would enable an artisan of ordinary skill in the art to understand the invention as described within the specification, and as such, is not essential for a proper understanding of the disclosed invention. More specifically, Applicants respectfully submit that one of ordinary skill in the art would understand the term comparator as used in the specification and how the comparator relates to the present invention.

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With respect to the apparatus for generating a fault indication signal, Applicants respectfully submit that such an exemplary apparatus is illustrated in Figures 1 and 2, and that the specification, in light of the Figures, would enable an artisan of ordinary skill in the art to understand the disclosed invention. More specifically, Applicants respectfully submit that one of ordinary skill in the art would understand the apparatus for generating a fault indication signal, after reading the specification, in light of the Figures.

With respect to the one pole lag filter, Applicants respectfully submit that an exemplary one pole lag filter is illustrated in Figure 2. More specifically, the specification recites at page 3, lines 12-14 that "V1 + V2 is fed to two separate simple one pole lag filters, i.e., a short term filter 52 and a long term filter 54." Applicants respectfully submit that one of ordinary skill in the art reading the specification, in light of the Figures, would understand the one pole lag filter of the disclosed invention. For at least the reasons set forth above, Applicant requests the objection to the drawings under 37 C.F.R. 1.81 be withdrawn.

The objection to the drawings under 37 C.F.R. 1.83(a) is respectfully traversed. Under 37 C.F.R. 1.83(a), conventional features disclosed in the description and claims need not be shown in the drawings where their detailed illustration is not essential for a proper understanding of the invention. Applicant respectfully submits that illustrations of a memory are not necessary for an understanding of the invention by one skilled in the art. However, to expedite prosecution, Figure 2 has been amended to include a memory.

With respect to the comparator, Applicants respectfully submit that a comparator is a conventional feature that need not be shown in the drawings, and as such, is not essential for a proper understanding of the invention. Applicant respectfully submits that an artisan of ordinary skill in the art would understand the comparator after reading the specification in light of the Figures.

With respect to the apparatus generating a fault indication signal and the one pole filter, Applicants respectfully submit that an exemplary apparatus that generates a fault indication

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signal and an exemplary one pole filter are illustrated in Figure 2. Furthermore, Applicants respectfully submit that one of ordinary skill in the art reading the specification, in light of the Figures, would understand the one pole lag filter and the apparatus that generates a fault indication signal of the disclosed invention. For the reasons set forth above, Applicant requests that the objection to the drawings under 37 C.F.R. 1.83(a) be withdrawn.

The rejection of Claims 1-18 under 35 U.S.C. § 112 is respectfully traversed.

Applicants respectfully submit that the specification of the present application satisfies the requirements of Section 112 and describes the invention in such a way as to enable one skilled in the art to make and/or use the invention. With respect to Claim 1, Claim 1 has been amended to recite a "method for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a logic circuit...." Applicants respectfully submit that an artisan of ordinary skill in the art would understand the scope of the invention as claimed after reading the specification in light of the Figures, including how the difference between a current value of the summed voltage and a reference value is determined, and how a fault indicator signal is generated. Accordingly, Claim 1 is submitted to overcome the Section 112 rejections. Claims 2-5 depend, directly or indirectly, from Claim 1 and are thus, submitted to overcome the Section 112 rejections.

Claim 6 has been amended to recite an apparatus for detecting faults in a transducer...the transducer being electrically connected to a logic circuit implemented in at least one of an on-board interface and an on-board controller...said apparatus comprising...a short term filter...a long term filter... at least one of said short term filter and said long term filter configured to maintain said second voltage value constant...summer..." Applicants respectfully submit that an artisan of ordinary skill in the art would understand the scope of the invention as claimed after reading the specification in light of the Figures, including how a difference signal representative of a difference between the first voltage and the second voltage value is generated by the apparatus, and how the fault indicator signal is generated by the apparatus. Accordingly, Claim

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6 is submitted to overcome the Section 112 rejections. Claims 7-14 depend, directly or indirectly, from Claim 6 and are thus, submitted to overcome the Section 112 rejections.

Claim 15 has been amended to recite an apparatus for detecting faults in a transducer... the transducer being electrically connected to a logic circuit implemented in at least one of an on-board interface and an on-board controller...." Applicants respectfully submit that an artisan of ordinary skill in the art would understand the scope of the invention as claimed after reading the specification in light of the Figures, including the operation of the apparatus summer with respect to a freeze threshold value and to an absolute value as the values relate to the first voltage value and the second voltage value. Accordingly, Claim 15 is submitted to overcome the Section 112 rejections. Claims 16-18 depend, directly or indirectly, from Claim 15 and are thus, submitted to overcome the Section 112 rejections.

For at least the reasons set forth above, Applicants respectfully request that the Section 112 rejection of Claims 1-18 be withdrawn.

The rejection of Claims 6-10 and 15-17 under 35 U.S.C. § 102(b) as being anticipated by Maher is respectfully traversed

Maher describes a variable differential transformer system 10 that includes a linear and a rotary path (L/RVDT). System 10 includes two short term filter stages that include a resistor R_{f1} and a capacitor C_{f1} . System 10 also includes a long term filter stage that includes a comparator CM3, resistors R35, R36, and R37, and a Capacitor C_{fau} . A DC component is supplied to a negative input of comparator CM3 to determine primary coil faults and short circuit faults. The DC component reference signals supplied to comparator CM3 are compared to fault thresholds, and if the difference between the signal values exceeds or is below the threshold, CM3 transmits a signal indicative of a fault.

Claim 6 recites an apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a

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logic circuit implemented in at least one of an on-board interface and an on-board controller, wherein the apparatus comprises "a short term filter for generating a first voltage value...a long term filter for generating a second voltage value...at least one of said short term filter and said long term filter configured to maintain said second voltage value constant...a summer for generating a difference signal...." Maher does not describe nor suggest an apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, wherein the transducer is electrically connected to a logic circuit implemented in at least one of an on-board controller, and wherein the apparatus includes a short term filter for generating a first voltage value, a long term filter for generating a second voltage value, and a summer for generating a difference signal, wherein at least one of said short term filter and said long term filters is configured to maintain the second voltage value constant. Specifically, Maher does not describe nor suggest an apparatus including a transducer connected to a logic circuit including a filter that is configured to maintain a voltage constant.

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Furthermore, Applicants respectfully disagree with the assertion within the Office Action that Maher inherently discloses a one pole lag filter having a time constraint of .150 seconds and 30 seconds. Specifically, Applicants respectfully submit that there is no teaching or suggestion inherent within Maher to use an apparatus including a one pole lag filter that has the above-mentioned time constraints. For the reasons set forth above, Claim 6 is submitted to be patentable over Maher.

Claims 7-10 depend, directly or indirectly, from independent Claim 6. When the recitations of Claims 7-10 are considered in combination with the recitations of Claim 6, Applicants submit that dependent Claims 7-10 likewise are patentable over Maher.

Claim 15 recites an apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a logic circuit implemented in at least one of an on-board interface and an on-board controller, wherein the apparatus comprises "a short term filter for generating a first voltage value...a long

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term filter for generating a second voltage value...a summer for generating a difference signal representative of a difference between the first voltage value and the second voltage value, if an absolute value of the difference between the first voltage value and the second voltage value exceeds a freeze threshold, then said long term filter maintains said second voltage value constant...."

Maher does not describe nor suggest an apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a logic circuit implemented in at least one of an on-board interface and an on-board controller, in combination with an apparatus including a short term filter for generating a first voltage value, a long term filter for generating a second voltage value, and a summer for generating a difference signal representative of a difference between the first voltage value and the second voltage value, wherein if an absolute value of the difference between the first voltage value and the second voltage value exceeds a freeze threshold, then the long term filter maintains the second voltage value constant. Specifically, Maher does not describe nor suggest an apparatus including a transducer connected to a logic circuit, in combination with a filter that maintains the second voltage value constant when an absolute value of the difference between the first and second voltages exceeds a freeze threshold.

Furthermore, Applicants respectfully disagree with the assertion that Maher inherently discloses a one pole lag filter having a time constraint of .150 seconds and 30 seconds. Specifically, Applicants respectfully submit that there is no teaching or suggestion inherent within Maher to use an apparatus including a one pole lag filter having the above-mentioned time constraints. For the reasons set forth above, Claim 15 is submitted to be patentable over Maher.

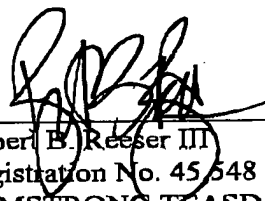
Claims 16 and 17 depend from independent Claim 15. When the recitations of Claims 16 and 17 are considered in combination with the recitations of Claim 15, Applicants submit that dependent Claims 16 and 18 likewise are patentable over Maher.

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For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 6-10 and 15-17 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



Robert B. Reeser III
Registration No. 45,548
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Cook et al.

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TECHNOLOGY DEVELOPMENT

SUBMISSION OF MARKED UP CLAIMS

Assistant Commissioner for Patents
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Sir:

Submitted herewith are marked up Claims in accordance with 37 C.F.R. 1.121(c)(1)(ii)

IN THE CLAIMS

1. (once amended) A method for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a logic circuit, said method comprising the steps of:

summing the voltage outputs to obtain a summed voltage value;

determining a difference between a current value of the summed voltage value to a reference value; and

if an absolute value of the difference between a current value of the summed voltage value and the reference value exceeds a freeze threshold, then maintaining the reference value constant.

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6. (twice amended) Apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a logic circuit implemented in at least one of an on-board interface and an on-board controller, said apparatus comprising:

a short term filter for generating a first voltage value representative of a current value of a sum of the secondary winding output voltages;

a long term filter for generating a second voltage value representative of a non-faulted value of a sum of the secondary winding output voltages, at least one of said short term filter and said long term filter configured to maintain said second voltage value constant; and

a [comparator] summer for generating a difference signal representative of a difference between the first voltage value and the second voltage value.

15. (once amended) Apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a logic circuit implemented in at least one of an on-board interface and an on-board controller, said apparatus comprising:

a short term filter for generating a first voltage value representative of a current value of a sum of the secondary winding output voltages, said short term filter comprising a one pole lag filter;

a long term filter for generating a second voltage value representative of a non-faulted value of a sum of the secondary winding output voltages, said long term filter comprising a one pole lag filter; and

a [comparator] summer for generating a difference signal representative of a difference between the first voltage value and the second voltage value, if an absolute value of the difference between the first voltage value and the second voltage value exceeds a freeze

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threshold, then said long term filter maintains said second voltage value constant, and if the absolute value of the difference between the first voltage value and the second voltage value exceeds a fault threshold, then said apparatus generates a fault indicator signal.

Respectfully Submitted,



Robert B. Reesor III
Registration No. 45,548
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070

552-6646